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LISTS OF SPECIES

Fishes from rio Ibirapuitã basin, Environmental Protection Area of Ibirapuitã, Pampa Biome

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ABSTRACT: The fish species herein presented were collected in streams, swamps and rivers of the rio Ibirapuitã basin, middle rio Uruguay basin, in the Environmental Protection Area of Ibirapuitã. Samplings resulted in 72 species distributed in 51 genera, 21 families, and six orders. This study represents the first fish survey in the EPA of Ibirapuitã (Pampa biome).

INTRODUCTION

The number of fish species in the rio Uruguay basin is still unclear, but in a recent study Malabarba *et al*. (2009) estimated 175 described species plus 50 undescribed species (about 20% of that total). The rio Ibirapuitã is one of main tributaries of the rio Ibicuí drainage (the largest drainage of the rio Uruguay basin) and fish inventories are nonexistent. Information about fish diversity from the rio Ibicuí is scarce (Bossemeyer *et al*. 1985; Copatti *et al*. 2009; Weis *et al*. 1983). However, some biological studies about few species have been conducted in this basin (*e.g*. Behr and Signor 2008; Giora and Fialho 2003; Zardo and Behr 2012).

The Pampa biome is one of the biomes with the lowest percentage of legally protected area, and in Brazil is represented only on the State of Rio Grande do Sul. The Environmental Protection Area (EPA) of Ibirapuitã is a Federal Conservation Unit in the Sustainable Use category, with an area of approximately 317,000 hectares representing the Pampa, distributed in municipalities of Alegrete, Quaraí, Rosário do Sul, and Sant'Ana do Livramento, State of Rio Grande do Sul (Silva 2010). The EPA of Ibirapuitã is located on the international border Brazil-Uruguay, in the West region of the State of Rio Grande do Sul, and its southern limit coincides with the Brazilian international limit. The climate in the region is subtropical characterized by rainy winter and hot summer.

Due to the lack of information about the ichthyofauna of this basin and be a legally protected area, the objective of this study is provide a species inventory, which may eventually support future studies on fish biology and conservation.

MATERIALS AND METHODS

Specimens were collected using a dip net (40 x 80 cm frame and 1 mm net mesh size), gill nets (20 m x 1.8 m, 2, 3, 4, 5, 6 cm between knots) and seine net (10 m x 2 m, 5 mm between knots), in May 2011, and in August and November 2012. The fishing gear was selected according to the environmental and hydrological conditions of the sampling sites. Nets remained for 12 to 14 h in the water. Fishes were collected under IBAMA (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis) permits, process number 26609-1. A total of thirty one sampling points were performed in the streams, swamps and rivers of the rio Ibirapuitã basin, EPA of Ibirapuitã (Table 1, Figures 1 and 2), except the sampled site "Passo dos Britos" which is near the northern of the EPA. The fish specimens collected were fixed in 10% formalin and preserved in 70% alcohol and were identified using pertinent literature and keys (Bertaco and Lucena 2010; Britski *et al*. 1999; Buckup and Reis 1997; Carvalho *et al*. 2008; Casciotta *et al*. 2003; Costa 1999; Figueiredo and Menezes 2000; Friel 2008; Ghazzi 2008; Lucena and Kullander 1992; Lucinda 2008; Malabarba and Weitzman 2003; Menezes 1987; Oyakawa and Mattox 2009; Reis *et al*. 1990).

Voucher specimens are deposited in the Coleção de Peixes do Museu de Ciências Naturais (MCN), Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre (Table 2). In addition to the specimens collected during this inventory were also considered the visual records and the records of species in scientific collections available on the SpeciesLink (www.splink.org.br). Additionally, the examination of the material cataloged in the collection of MCN resulted in the addition of two species for the rio Ibirapuitã basin. The classification of fishes followed Reis *et al*. (2003a). The common name of species is usual in southern Brazil and followed Reis *et al*. (2003a). In the Table 2, for each species is indicate their respective capture habitat, *e. g.* "River" for species collected in rivers.

RESULTS AND DISCUSSION

Six thousand five hundred and twenty-two fish specimens, belonging to six orders, 21 families, 51 genera and 72 species were collected (Table 2). All species are native to the rio Uruguay basin. Among the specimens collected, 57.7% were Characiformes, 30% Siluriformes, 8.5% Perciformes, 2.8% Cyprinodontiformes, and less than 3% Pleuronectiformes and Synbranchiformes. The most abundant species were *Diapoma terofali* (Géry) (19.5%), *Odontostilbe pequira* (Steindachner) (14.7%), *Bryconamericus iheringii* (Boulenger) (13.1%), and *Cyanocharax alegretensis* Malabarba and Weitzman (10.9%), all small characids. According to Vari and Malabarba (1998), Lowe-McConnell (1999) and Castro

(1999), the predominance of the Characiformes and Siluriformes seems to be a trend for Neotropical rivers.

The absence of Gymnotiformes species in the catches can be due to the characteristics of the studies sites (rocky substrate, water transparent and current, and absence of aquatic vegetation). Copatti *et al*. (2009) also not captured no gymnotiform species in the rio Jaguari basin, a tributary of rio Ibicuí, and Carlos E. B. Machado (pers. comm.) collected only one species of Gymnotiformes (*Brachyhypopomus* sp.n.= *B. draco* Giora, Malabarba and Crampton) in the arroio Taquarembó, tributary of rio Santa Maria, rio Ibicuí basin. According to Giora *et al*. (2008) *Brachyhypopomus draco* inhabits river edges, slow-moving creeks, lagoons and flooded areas with muddy or sandy bottom and abundant emergent or floating vegetation, a habitat not found in the rio Ibirapuitã basin.

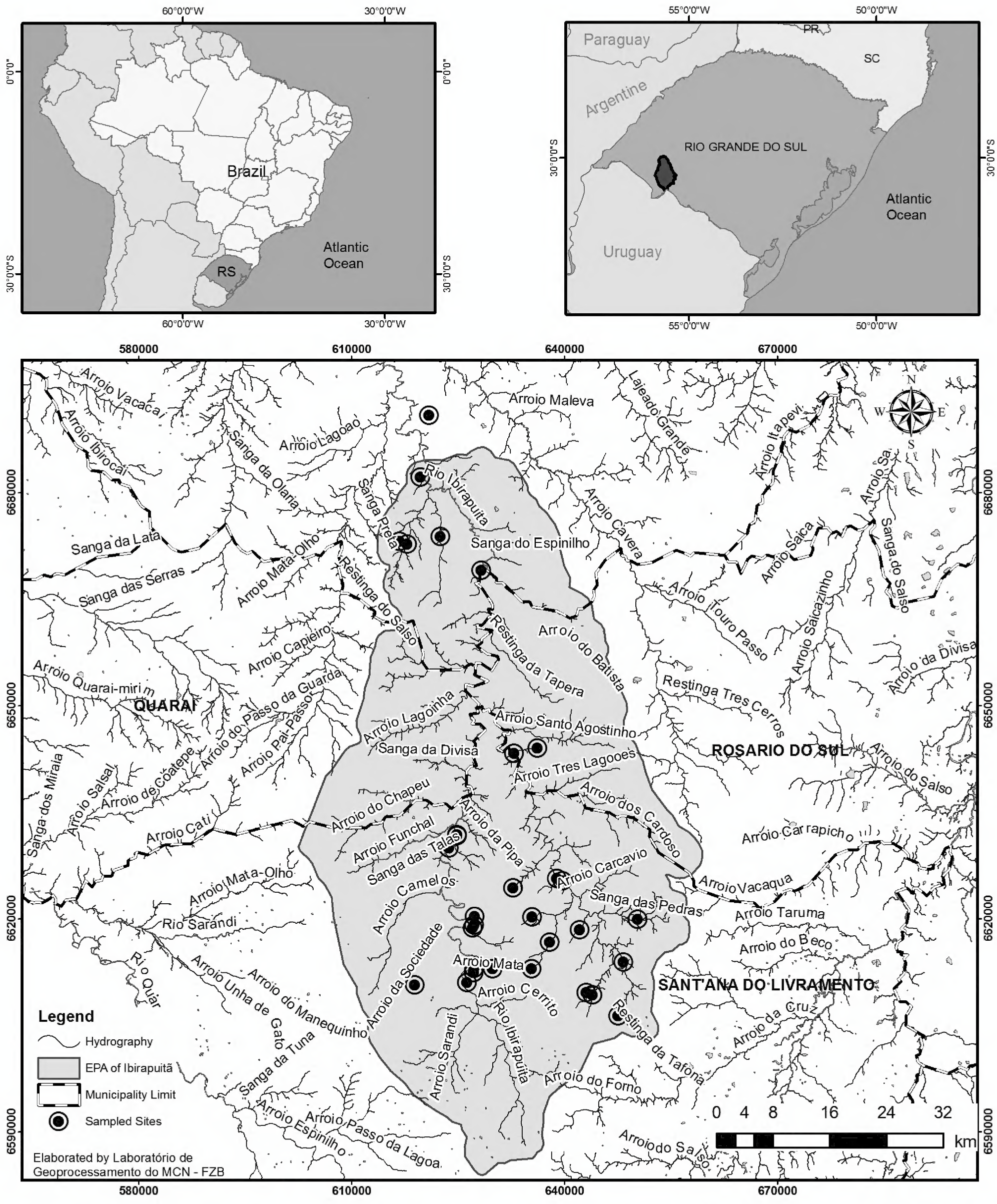

FIGURE 1. Map of the studied area showing the collection sites in the rio Ibirapuitã basin, Environmental Protection Area of Ibirapuitã, Rio Grande do Sul State, Brazil. PR = Paraná State, SC = Santa Catarina State. Some points (black circles) on the map may be superimposed due to the proximity of the sampled sites.

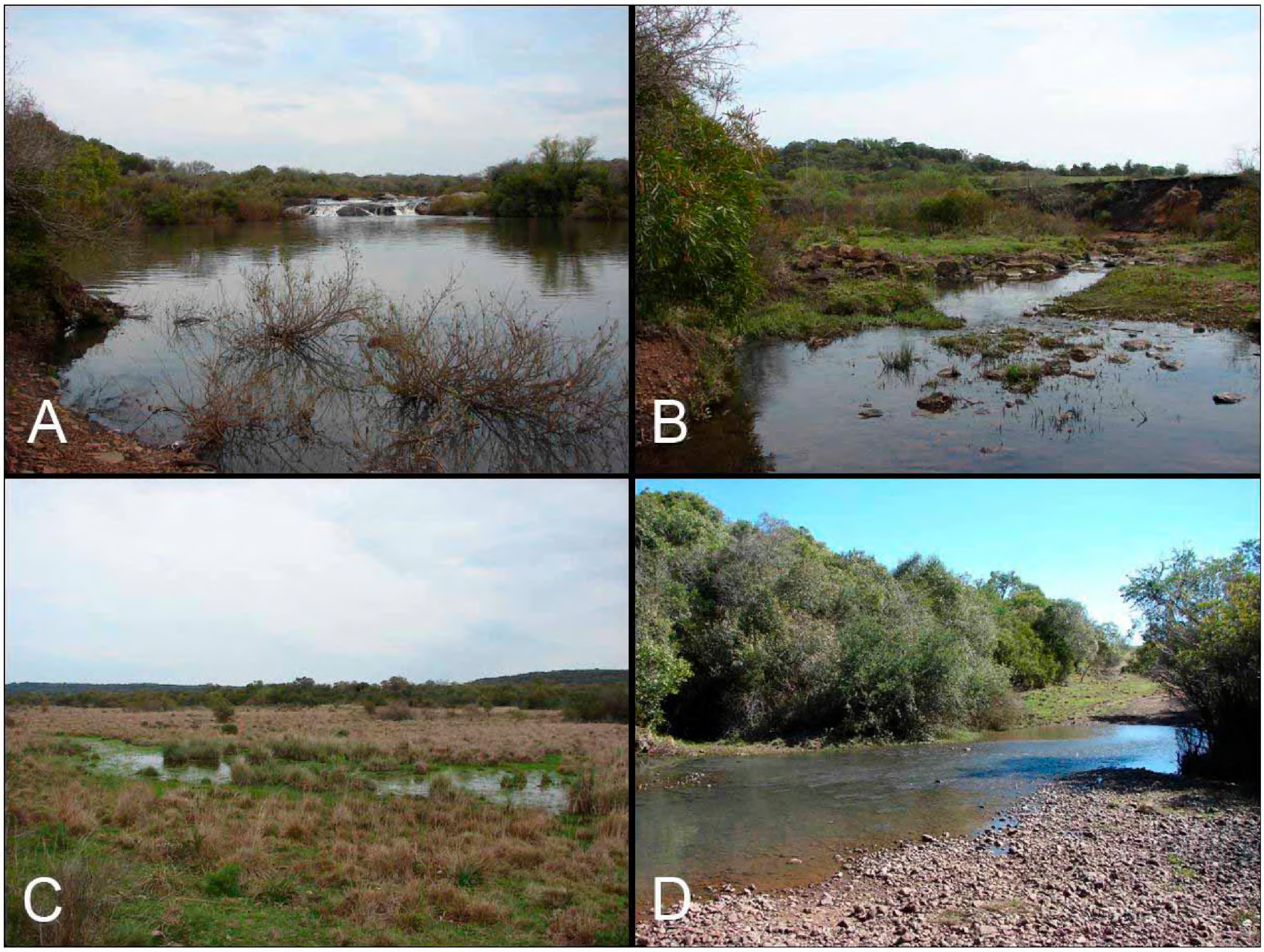

Figure 2. Examples of sampled habits in the rio Ibirapuitã basin, Environmental Protection Area of Ibirapuitã. A- Downstream of waterfall of rio Ibirapuitã; B- Arroio Lageado; C- Swamp 300 m of the rio Ibirapuitã; D- Arroio da Sociedade.

Table 1. Description of sampled sites in the rio Ibirapuitã basin, Environmental Protection Area of Ibirapuitã, Rio Grande do Sul State, Brazil.

SITES	LOCALITY	C°°RDINATES	MUNICIPALITY
1	Rio Ibirapuitã, Passo dos Britos	29°54'24"S 55°44'51"W	Alegrete
2	Rio Ibirapuitã, Sá Brito Farm	29°59'08"S 55°45'31"W	Alegrete
3	Rio Ibirapuitã, Marona Farm	30°06'11"S 55°40'05"W	Rosário do Sul
4	Arroio Pulador, tributary of rio Ibirapuitã	30°03'38"S 55°43'44"W	Alegrete
5	Arroio Carambola	30°04'14"S 55°46'37"W	Alegrete
6	Tributary of arroio Carambola	30°04'03"S 55°47'18"W	Alegrete
7	Rio Ibirapuitã, São Diogo Farm, Passo do Ferrão	30°27'23"S 55°42'40"W	Sant'Ana do Livramento
8	Tributary of rio Ibirapuitã Chico	30°33'29"S 55°31'03"W	Sant'Ana do Livramento
9	Tributary of rio Ibirapuitã Chico	30°40'00"S 55°27'35"W	Sant'Ana do Livramento
10	Arroio da Lagoinha, tributary of rio Ibirapuitã Chico	30°38'27"S 55°29'51"W	Sant'Ana do Livramento
11	Tributary of rio Ibirapuitã Chico	30°38'17"S 55°30'25"W	Sant'Ana do Livramento
12	Arroio Passo das Pedras	30°32'38"S 55°25'58"W	Sant'Ana do Livramento
13	Tributary of rio Ibirapuitã Chico	30°35'55"S 55°27'10"W	Sant'Ana do Livramento
14	Tributary of rio Ibirapuitã Chico	30°36'34"S 55°38'41"W	Sant'Ana do Livramento
15	Tributary of rio Ibirapuitã Chico	30°36'31"S 55°35'15"W	Sant'Ana do Livramento
16	Tributary of rio Ibirapuitã Chico	30°36'32"S 55°40'18"W	Sant'Ana do Livramento
17	Tributary of rio Ibirapuitã Chico	30°36'51"S 55°40'21"W	Sant'Ana do Livramento
18	Rio Ibirapuitã, Passo do Cerrito	30°37'37"S 55°40'57"W	Sant'Ana do Livramento
19	Arroio da Sociedade, tributary of rio Ibirapuitã	30°37'52"S 55°45'32"W	Sant'Ana do Livramento
20	Tributary of rio Ibirapuitã Chico	30°34'28"S 55°33'40"W	Sant'Ana do Livramento
21	Tributary of rio Ibirapuitã Chico	30°32'33"S 55°35'17"W	Sant'Ana do Livramento
22	Tributary of rio Ibirapuitã	30°33'27"S 55°40'28"W	Sant'Ana do Livramento
23	Swamp 300 m of rio Ibirapuitã	30°33'13"S 55°40'22"W	Sant'Ana do Livramento
24	Arroio Lageado, tributary of rio Ibirapuitã	30°32'35"S 55°40'21"W	Sant'Ana do Livramento
25	Tributary of rio Ibirapuitã Chico	30°30'23"S 55°36'58"W	Sant'Ana do Livramento
26	Rio Ibirapuitã, donwstream of waterfall, Cachoeira Farm	30°26'22"S 55°41'59"W	Sant'Ana do Livramento
27	Rio Ibirapuitã Chico, Olaria Farm, Passo das Catacumbas	30°29'47"S 55°32'38"W	Sant'Ana do Livramento
28	Rio Ibirapuitã Chico, Olaria Farm, Passo das Catacumbas	30°29'36"S 55°33'07"W	Sant'Ana do Livramento
29	Tributary of rio Ibirapuitã Chico	30°19'42"S 55°34'59"W	Rosário do Sul
30	Rio Ibirapuitã Chico, Passo do Mineiro	30°20'07"S 55°37'02"W	Rosário do Sul
31	Rio Ibirapuitã, upstream of waterfall, Cachoeira Farm	30°26'25"S 55°41'59"W	Sant'Ana do Livramento

Table 2. List of fish species registered in the rio Ibirapuitã basin, Environmental Protection Area of Ibirapuitã, Rio Grande do Sul State, Brazil and their respective capture habitat. 1- Visual records; 2- Scientific collections records.

ORDER/ Family/ *Species*	Common name	River	Stream	Swamp	Voucher (MCN)
CHARACIFORMES					
Parodontidae					
Apareiodon affinis (Steindachner, 1879)	Charuto	X			19606
Curimatidae					
Cyphocharax spilotus (Vari, 1987)	Biru	X	X		19607
Cyphocharax voga (Hensel, 1870)	Biru	X			19608
Steindachnerina biornata (Braga and Azpelicueta, 1987)	Biru	X	X		19488
Steindachnerina brevipinna (Eigenmann and Eigenmann, 1889)	Biru	X			19598
Prochilodontidae					
Prochilodus lineatus (Valenciennes, 1837)	Grumatã	X			19670
Anostomidae					
Leporinus obtusidens (Valenciennes, 1837)	Piava[1]	X			-
Schizodon nasutus Kner, 1858	Voga	X			19614
Crenuchidae					
Characidium occidentale Buckup and Reis, 1997	Canivete		X		19466
Characidium pterostictum Gomes, 1947	Canivete	X	X		19509
Characidium rachovii Regan, 1913	Canivete	X	X		19521
Characidium aff. *zebra* Eigenmann, 1909	Canivete	X	X		19535
Characidae					
Aphyocharax anisitsi Eigenmann and Kennedy, 1903	Lambari	X	X		19603
Astyanax aff. *fasciatus* (Cuvier, 1819)	Lambari-do-rabo-vermelho	X			19594
Astyanax jacuhiensis (Cope, 1894)	Lambari-do-rabo-amarelo	X	X		19592
Astyanax saguazu Casciotta, Almirón and Azpelicueta, 2003	Lambari-olhudo	X			19630
Astyanax sp.n.	Lambari	X	X		19631
Bryconamericus iheringii (Boulenger, 1887)	Lambarizinho	X	X		19635
Bryconamericus stramineus Eigenmann, 1908	Lambarizinho	X			19634
Charax stenopterus (Cope, 1894)	Lambari-transparente	X	X		19602
Cheirodon ibicuhiensis Eigenmann, 1915	Lambari	X	X		19590
Cheirodon interruptus (Jenyns, 1842)	Lambari	X			19573
Cyanocharax alburnus (Hensel, 1870)	Lambari-branco	X			19637
Cyanocharax alegretensis Malabarba and Weitzman, 2003	Lambari	X	X		19564
Diapoma terofali Géry, 1964	Lambari	X	X		19650
Heterocheirodon yatai (Casciotta, Miquelarena and Protogino, 1992)	Lambari	X			19589
Hyphessobrycon luetkenii (Boulenger, 1887)	Lambari	X			19623
Hyphessobrycon meridionalis Ringuelet, Miquelarena and Menni, 1978	Lambari	X	X		19596
Hyphessobrycon togoi Miquelarena and López, 2006	Lambari	X	X		19604
Hypobrycon sp.n.	Lambari	X	X		19669
Moenkhausia dichroura (Kner, 1858)	Lambari		X		19668
Odontostilbe pequira (Steindachner, 1882)	Lambari	X			19617
Oligosarcus jenynsii (Günther, 1864)	Tambicu		X		19582
Oligosarcus oligolepis (Steindachner, 1867)	Tambicu	X			19638
Pseudocorynopoma doriae Perugia, 1891	Lambari-bandeira	X	X		19570
Pygocentrus nattereri Kner, 1858	Piranha	X			19676
Salminus brasiliensis (Cuvier, 1816)	Dourado[1]	X			-
Serrapinnus calliurus (Boulenger, 1900)	Lambari	X			19595
Serrasalmus maculatus Kner, 1858	Piranha	X			19644
Cynodontidae					
Rhaphiodon vulpinus (Spix and Agassiz, 1829)	Cachorra[2]	X			9960
Acestrorhynchidae					
Acestrorhynchus pantaneiro Menezes, 1992	Peixe-cachorro	X	X		19586
Erythrinidae					
Hoplias lacerdae Miranda-Ribeiro, 1908	Traírão	X	X		19561
SILURIFORMES					
Aspredinidae					
Bunocephalus doriae Boulenger, 1902	Peixe-banjo	X			19613
Pseudobunocephalus iheringii (Boulenger, 1891)	Peixe-banjo	X			19601
Trichomycteridae					
Homodiaetus anisitsi Eigenmann and Ward, 1907	Cambeva	X			19609
Scleronema sp.	Cambeva	X	X		19545

TABLE 2. ***CONTINUED.***

ORDER/ Family/ *Species*	Common name	River	Stream	Swamp	Voucher (MCN)
Callichthyidae					
Corydoras paleatus (Jenyns, 1842)	Limpa-fundo	X	X		19610
Loricariidae					
Ancistrus taunayi Miranda-Ribeiro, 1918	Cascudo-roseta	X			19507
Hemiancistrus fuliginosus Cardoso and Malabarba, 1999	Cascudo	X			19643
Hisonotus nigricauda (Boulenger, 1891)	Cascudinho		X		19619
Hisonotus ringueleti Aquino, Schaefer and Miquelarena, 2001	Cascudinho[2]		X		11383
Hypostomus commersoni Valenciennes, 1836	Cascudo	X			19674
Hypostomus isbrueckeri Reis, Weber and Malabarba, 1990	Cascudo	X			19618
Hypostomus roseopunctatus Reis, Weber and Malabarba, 1990	Cascudo	X			19677
Loricariichthys melanocheilus Reis and Pereira, 2000	Viola	X	X		19556
Rineloricaria stellata Ghazzi, 2008	Violinha	X	X		19468
Rineloricaria zaina Ghazzi, 2008	Violinha	X			19678
Pseudopimelodidae					
Microglanis cottoides (Boulenger, 1891)	Bagrinho-malhado		X		19625
Heptapteridae					
Heptapterus mustelinus (Valenciennes, 1836)	Bagrinho	X	X		19469
Phenacorhamdia sp.	Bagrinho		X		19626
Pimelodella gracilis (Valenciennes, 1835)	Mandi	X			19615
Pimelodidae					
Pimelodus absconditus Azpelicueta, 1995	Pintado	X			19645
Pimelodus maculatus Lacépède, 1803	Pintado	X			19672
Doradidae					
Rhinodoras dorbignyi (Kner, 1855)	Armado	X			19679
CYPRINODONTIFORMES					
Rivulidae					
Austrolebias periodicus (Costa, 1999)	Peixe-anual			X	19572
Poeciliidae					
Phalloceros caudimaculatus (Hensel, 1868)	Barrigudinho		X		19467
SYNBRANCHIFORMES					
Synbranchidae					
Synbranchus marmoratus Bloch, 1795	Muçum		X		19501
PERCIFORMES					
Cichlidae					
Australoheros fascetus (Jenyns, 1842)	Cará	X	X		19478
Crenicichla lepidota (Heckel, 1840)	Joana	X	X		19525
Crenicichla missioneira Lucena and Kullander, 1992	Joana	X			19640
Crenicichla scottii (Eigenmann, 1907)	Joana	X			19611
Gymnogeophagus rhabdotus (Hensel, 1870)	Cará	X	X		19471
Gymnogeophagus sp.n.	Cará	X	X		19472
PLEURONECTIFORMES					
Achiridae					
Catathyridium jenynsii (Günther, 1862)	Linguado	X			19675

Most of the collected species occurred both in the river channel and streams, 37 of them occurring only on "river" and eight exclusively on "stream" (Table 2). In the unique sampled flood area ("swamp") only one species of annual fish was collected (*Austrolebias periodicus* Costa, Rivulidae). This swamp is located about 300 m from rio Ibirapuitã bank, and is relatively well-preserved (Figure 2C). The species of *Austrolebias* live in temporary pools and swamps formed during the rainy months (Costa, 2006). *Austrolebias periodicus* is considered threatened in Brazil (MMA, 2004; Rosa and Lima, 2008). In State of Rio Grande do Sul, the species also is considered threatened in the category "Vulnerable", mainly due to its restricted area of distribution and loss and degradation of its habitat (Reis *et al*. 2003b).

Five species were provisionally identified given their uncertain taxonomic status or because they represent undescribed species (*Astyanax* sp., *Gymnogeophagus* sp., *Hypobrycon* sp., *Phenacorhamdia* sp. and *Scleronema* sp.). On the other hand, results herein obtained indicate that the diversity of fish in the study area is similar to that known for the rio Ibicuí basin.

Astyanax saguazu was described for two tributaries of the middle rio Uruguay basin, in the province of Misiones, Argentina (Casciotta *et al*. 2003). The presence of this species in the rio Ibirapuitã basin is the first record for Rio Grande do Sul State, Brazil.

In this study two collected species were recognized as long distance migratory fish by Luz-Agostinho *et al*. (2010), *Prochilodus lineatus* (Valenciennes) and *Pimelodus*

maculatus Lacépède. Beyond these, two more long distance migratory fish were visually observed downstream to the waterfall of rio Ibirapuitã (*ca*. 30°26'S 55°41'W): the "dourado" *Salminus brasiliensis* (Cuvier, 1816) and the "piava" *Leporinus obtusidens* (Valenciennes, 1837). The specimens of *S. brasiliensis* (*ca*. 50 cm of standard length) were observed in June/2012 by Mariano Pairet (FZBRS, pers. comm.) and of *L. obtusidens* (*ca*. 40 cm of SL), *P. lineatus* (35 to 40 cm of SL) and *P. maculatus* (25 to 30 cm of SL) in November/2012. In State of Rio Grande do Sul, *Salminus brasiliensis* is considered to be a threatened species in the category "Vulnerable", due to the alteration of habitat mainly by the interruption of migratory routes caused by hydroelectric dams (Reis *et al*. 2003b). Most of rio Ibirapuitã basin is located within a Federal Conservation Unity, and it is one of the few fluvial systems of the State of Rio Grande do Sul free of hydroelectric dams, therefore only future studies may indicate the importance of the basin for migratory fish.

Based on specimens collected during this inventory, and the species recorded visually and records in scientific collections, the fish richness on the rio Ibirapuitã basin was relatively high when compared to the rio Uruguay basin, comprising 41% (74 species) of the total number of species estimated for that basin. This result reinforces the importance of preservation of the unique conservation unit on the Pampa biome.

In other studies conducted in the tributaries of the rio Ibicuí, a similar number of species was also found: 81 species to the rio Ibicuí-Mirim (Weis *et al*. 1983), and 53 species to the rio Santa Maria (Bossemeyer *et al*. 1985). According to Everton Behr (UFSM, pers. comm.) 111 fish species are found in the rio Ibicuí basin along two years of ichthyofauna study. According to that information, the 74 species recorded herein represent about 66% of total species from the basin.

We reinforced that ecological studies as well as conservation efforts on the ichthyofauna are largely encouraged in all the rio Ibirapuitã basin, EPA of Ibirapuitã, mainly due to the presence of migratory and threatened species.

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Literature Cited

Behr, E.R. and C.A. Signor. 2008. Distribuição e alimentação de duas espécies simpátricas de piranhas *Serrasalmus maculatus* e *Pygocentrus nattereri* (Characidae, Serrassalminae) do rio Ibicuí, Rio Grande do Sul, Brasil. *Iheringia, Série Zoologia* 98(4): 501-507.

Bertaco, V.A. and C.A.S. Lucena. 2010. Redescription of the *Astyanax obscurus* (Hensel, 1870) and *A. laticeps* (Cope, 1894) (Teleostei: Characidae): two valid freshwater species originally described from rivers of Southern Brazil. *Neotropical Ichthyology* 8(1): 7-20.

Bossemeyer, I.M.K., M.L.C. Weis, S.T. Benemann and M.L.S. Bier. 1985. Ictiofauna do rio Santa Maria, RS. *Ciência e Natura* 7(2): 209-222.

Britski, H.A., K.Z. Silimon and B.S.Lopes. 1999. *Peixes do Pantanal: Manual de identificação*. Brasília: Embrapa. 184 p.

Buckup, P.A. and R.E. Reis. 1997. Characidiin genus *Characidium* (Teleostei, Characiformes) in Southern Brazil, with description of three new species. *Copeia* 1997(3): 531-548.

Carvalho, F.R., F. Langeani, C.S. Miyazawa and W.P. Troy. 2008. *Hyphessobrycon rutiliflavidus* n. sp., a new characid fish from the upper rio Paraguai, State of Mato Grosso, Brazil (Characiformes: Characidae). *Zootaxa* 1674: 39-49.

Casciotta, J.R. , A.E. Almirón and M. de las M. Azpelicueta. 2003. A new species of *Astyanax* from río Uruguay basin, Argentina (Characiformes: Characidae). *Ichthyological Exploration of Freshwaters* 14(4): 329-334.

Castro, R.M.C. 1999. Evolução da ictiofauna de riachos sul-americanos: padrões gerais e possíveis processos casuais; p. 139-155 *In* E.P. Caramaschi, R. Mazzoni, C.R.S.F. Bizerril and P.R. Peres-Neto (ed.). *Ecologia de peixes de riachos: estado atual e perspectivas.* Rio de Janeiro: Oecologia.

Copatti, C.E., L.G. Zanini and A. Valente. 2009. Ictiofauna da microbacia do rio Jaguari, Jaguari/RS, Brasil. *Biota Neotropica* 9(2): 179-186.

Costa, W.J.E.M. 1999. *Cynolebias periodicus*, a new annual fish from the rio Ibicuí drainage, southern Brazil (Cyprinodontiformes: Rivulidae). *Ichthyological Exploration of Freshwaters* 10(4): 297-302.

Costa, W.J.E.M. 2006. The South American annual killifish genus *Austrolebias* (Teleostei: Cyprinodontiformes: Rivulidae): phylogenetic relationships, descriptive morphology and taxonomic revision. *Zootaxa* 1213: 1-162.

Figueiredo, J.L. and N.A. Menezes. 2000. *Manual de peixes marinhos do sudeste do Brasil, VI- Teleostei (5)*. Museu de Zoologia da Universidade de São Paulo. 116 p.

Friel, J.P. 2008. *Pseudobunocephalus*, a new genus of banjo catfish with the description of a new species from the Orinoco River system of Colombia and Venezuela (Siluriformes: Aspridinidae). *Neotropical Ichthyology* 6(3): 293-300.

Ghazzi, M.S. 2008. Nove espécies do gênero *Rineloricaria* (Siluriformes, Loricariidae) do rio Uruguai, do sul do Brasil. *Iheringia, Série Zoologia* 98(1): 100-122.

Giora, J. and C. B. Fialho. 2003. Biologia alimentar de *Steindachnerina brevipinna* (Characiformes, Curimatidae) do rio Ibicuí-Mirim, Rio Grande do Sul, Brasil. *Iheringia, Série Zoologia* 93(3): 277-281.

Giora, J., L.R. Malabarba and W.G.R. Crampton. 2008. *Brachyhypopomus draco*, a new sexually dimorphic species of Neotropical electric fish from southern South America (Gymnotiformes: Hypopomidae). *Neotropical Ichthyology*, 6(2): 159-168.

Lowe-Mcconnell, R.H. 1999. *Estudos ecológicos em comunidades de peixes tropicais*. São Paulo: EDUSP. 534 p.

Lucena, C.A.S. and S.O. Kullander. 1992. The *Crenicichla* (Teleostei: Cichlidae) species of the Uruguai River drainage in Brazil. *Ichthyological Exploration of Freshwaters* 3(2): 97-160.

Lucinda, P.H.F. 2008. Systematics and biogeography of the genus *Phalloceros* Eigenmann, 1907 (Cyprinodontiformes: Poeciliidae: Poeciliinae), with the description of twenty-one new species. *Neotropical Ichthyology* 6(2): 113-158.

Luz-Agostinho, K.D.G., J.D. Latini, F. Abujanra, L.C. Gomes and A.A. Agostinho. 2010. *A ictiofauna do rio das Antas: distribuição e bionomia das espécies*. Maringá: Clichetec. 115 p.

Malabarba, L.R. and S.H. Weitzman. 2003. Description of new genus with six new species from southern Brazil, Uruguay and Argentina, with a discussion of a putative characid clade (Teleostei: Characiformes: Characidae). *Comunicações do Museu de Ciências e Tecnologia da PUCRS, Série Zoologia* 16(1): 67-151.

Malabarba, L.R., C.B. Fialho, J.A. Anza, J.F. Santos and G.N. Mendes. 2009. Peixes; p. 131-156 *In* I.I. Boldrini (org.). *Biodiversidade dos Campos do Planalto das Araucárias*. Brasília: Ministério do Meio Ambiente.

Menezes, N.A. 1987. Três espécies novas de *Oligosarcus* Günther, 1864 e redefinição taxonômica das demais espécies do gênero (Osteichthyes, Teleostei, Characidae). *Boletim de Zoology* 11: 1-39.

MMA (Ministério do Meio Ambiente). 2004. Instrução Normativa Nº5, de 21 de maio de 2004. Brasília: Ministério do Meio Ambiente. 14 p.

Oyakawa, O.T. and G.M.T. Mattox. 2009. Revision of the Neotropical trahiras of the *Hoplias lacerdae* species-group (Ostariophysi: Characiformes: Erythrinidae) with descriptions of two new species. *Neotropical Ichthyology* 7(2): 117-140.

Reis, R.E., C. Weber and L.R. Malabarba. 1990. Review of the genus *Hypostomus* Lacepéde, 1803 from southern Brazil, with descriptions of three new species (Pisces: Siluriformes: Loricariidae). *Revue suisse de Zoologie* 97(3): 729-766.

Reis, R.E., S.O. Kullander and C.J. Ferraris. 2003a. *Check List of the Freswater Fishes of South and Central America*. Porto Alegre: Edipucrs. 729 p.

Reis, R.E., Z.M.S. Lucena, C.A.S. Lucena and L.R. Malabarba. 2003b. Peixes; p. 117-145 *In* C.S. Fontana, G.A. Bencke and R.E. Reis (org.). *Livro vermelho da fauna ameaçada de extinção no Rio Grande do Sul*. Porto Alegre: Edipucrs.

Rosa, R.S. and F.C.T. Lima. 2008. Os peixes brasileiros ameaçados de extinção; p. 9-19 *In* A.B.M. Machado, G.M. Drumond and A.P. Paglia (ed.). *Livro vermelho da fauna ameaçada de extinção*. Brasília: Ministério do Meio Ambiente.

Silva, E.L. 2010. O Pampa e a APA do Ibirapuitã: estratégias e ações para

a sustentabilidade; p. 32-61 *In* B.P. da Costa, J.H. Quoos and M.E.G. Dickel (org.). *A sustentabilidade da região da Campanha-RS: práticas e teorias a respeito das relações entre ambiente, sociedade, cultura e políticas públicas*. Santa Maria: UFSM.

Vari, R.P. and L.R. Malabarba. 1998. Neotropical ichthyology: an overview; p. 1-12 *In* L.R. Malabarba, R.E.Reis, R.P.Vari, Z.M.S.Lucena and C.A.S. Lucena (eds.). *Phylogeny and classification of Neotropical fish*. Porto Alegre: Edipucrs.

Weis, M.L.C., I.M.K. Bossemeyer, M.L.S. Bier and H.O. Lippold. 1983. Inventário da fauna ictiológica do rio Ibicuí-Mirim, RS. *Ciência e Natura* 5(2): 135-152.

Zardo, E.L. and E.R. Behr. 2012. Estrutura populacional de *Trachelyopterus albicrux* (Siluriformes, Auchenipteridae) no rio Ibicuí, Rio Grande do Sul, Brasil. *Biotemas* 25(2): 67-73.

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